

WHAT IS CLAIMED IS:

1. A nucleic acid detection sensor comprising:  
a plurality of nucleic acid chain fixed electrodes  
to which a probe nucleic acid chain is fixed; and

5 a counter electrode which is arranged opposite to  
the nucleic acid chain fixed electrode, wherein a  
current flowing between the counter electrode and the  
nucleic acid chain fixed electrode.

2. The nucleic acid detection sensor according to  
10 claim 1, wherein the counter electrode is commonly  
provided to a plurality number of the nucleic acid  
chain fixed electrodes.

3. The nucleic acid detection sensor according to  
claim 1, wherein the counter electrode is provided for  
15 each of the nucleic acid chain fixed electrodes.

4. The nucleic acid detection sensor according to  
claim 1, wherein

each of the nucleic acid chain fixed electrodes  
has a flat plane to which the probe nucleic acid is  
20 fixed,

the counter electrode has a flat plane, and  
the flat plane of one of the nucleic acid chain  
fixed electrodes is arranged to face the flat plane of  
the counter electrode.

5. The nucleic acid detection sensor according to  
claim 1, wherein

the nucleic acid chain fixed electrodes and the

counter electrode is arranged to flow a test liquid therebetween.

6. The nucleic acid detection sensor according to claim 1, wherein

5           the nucleic acid chain fixed electrodes and the counter electrode are exposed to a test liquid and detect a current change between the nucleic acid chain fixed electrodes and the counter electrode caused by a hybridization of the probe nucleic acid and a nucleic acid in the test liquid.

7. The nucleic acid detection sensor according to claim 1, wherein

          a duplex chain cognitive body is added to the test liquid, and

15           a current change between the nucleic acid chain fixed electrodes and the counter electrode is caused by the duplex chain cognitive body.

8. The nucleic acid detection sensor according to claim 1, wherein

20           the nucleic acid chain fixed electrodes and the counter electrode are comb electrodes, and arranged to be mutually engaged.

9. The nucleic acid detection sensor according to claim 1, further comprising

25           a reference electrode provided for each of the nucleic acid chain fixed electrodes, configured to make a voltage between the nucleic acid chain fixed

electrodes and the counter electrode constant.

10. A nucleic acid detection sensor comprising:

a plurality of nucleic acid chain fixed electrodes  
to which the probe nucleic acid chain is fixed;

5 a counter electrode, a current flowing between  
each of the nucleic acid chain fixed electrodes and the  
counter electrode; and

a reference electrode provided for each of the  
nucleic acid chain fixed electrodes, configured to make  
10 a voltage between the nucleic acid chain fixed  
electrode and the counter electrode constant.

11. The nucleic acid detection sensor according to  
claim 10, wherein

15 the nucleic acid chain fixed electrodes and the  
reference electrode are comb electrodes and are  
arranged to be engaged.

12. The nucleic acid detection sensor according to  
claim 10, further comprising:

20 a first amplifier which inputs a signal from the  
reference electrode or a scanning line;

a second amplifier to input a reference potential  
to apply a predetermined potential to the counter  
electrode; and

25 a reference resistor connected between an output  
side of the first amplifier and the reference potential.

13. The nucleic acid detection sensor according to  
claim 10, wherein

the nucleic acid chain fixed electrodes and the counter electrode are exposed to a test liquid and detect a current change between the nucleic acid chain fixed electrodes and the counter electrode caused by a hybridization of the probe nucleic acid and a nucleic acid in the test liquid.

14. The nucleic acid detection sensor according to claim 13, wherein

a duplex chain cognitive body is added to the test liquid, and

a current change between the nucleic acid chain fixed electrodes and the counter electrode is caused by the duplex chain cognitive body.

15. The nucleic acid detection sensor according to claim 10, wherein

the counter electrode and the nucleic acid chain fixed electrode are formed on a same plane and the counter electrode is formed so as to surround the nucleic acid chain fixed electrode.

20 16. A nucleic acid detection sensor comprising:

a plurality of nucleic acid chain fixed electrode, to which a probe nucleic acid chain is fixed, arranged in a matrix;

a plurality of scanning lines configured to select the plurality of nucleic acid chain fixed electrodes one by one;

a plurality of signal lines configured to transmit

a measurement signal from the plurality of nucleic acid chain fixed electrodes;

a plurality of switching elements connected with the plurality of signal lines; and

5 an A/D converter connected with the plurality of switching elements.

17. The nucleic acid detection sensor according to claim 16, further comprising

10 a reference electrode provided for each of the nucleic acid chain fixed electrodes, configured to make a voltage between the nucleic acid chain fixed electrodes and the counter electrode constant.

18. The nucleic acid detection sensor according to claim 16, wherein

15 the counter electrode and the nucleic acid chain fixed electrode are formed on a same plane and the counter electrode is formed so as to surround the nucleic acid chain fixed electrode.

19. The nucleic acid detection sensor according to claim 16, wherein

20 the nucleic acid chain fixed electrodes and the counter electrode are exposed to a test liquid and detect a current change between the nucleic acid chain fixed electrodes and the counter electrode caused by a hybridization of the probe nuclei acid and a nuclei acid in the test liquid.

25 20. The nucleic acid detection sensor according to

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a current change between the nucleic acid chain  
5 fixed electrodes and the counter electrode is caused by  
the duplex chain cognitive body.